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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,259	03/01/2004	Tomoyuki Fujii	815_012	9799
25191	7590	07/13/2006	EXAMINER	
BURR & BROWN PO BOX 7068 SYRACUSE, NY 13261-7068			BAUER, SCOTT ALLEN	
			ART UNIT	PAPER NUMBER
			2836	
DATE MAILED: 07/13/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/790,259

Applicant(s)

FUJII ET AL.

Examiner

Scott Bauer

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/01/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to because the pictures submitted as Figs. 4A, 4B, 5A & 5B are not of sufficient quality to enable the invention. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

FIG. 4A

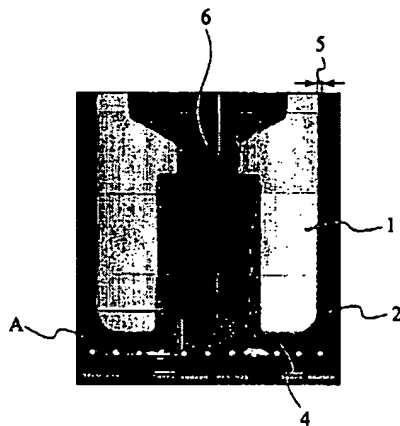


FIG. 5A

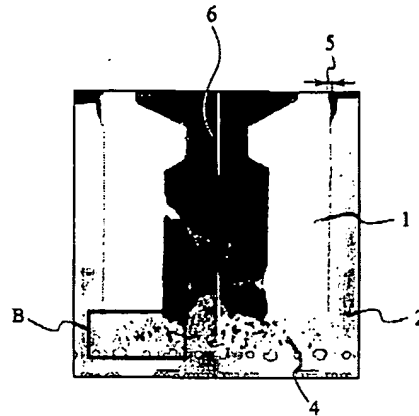
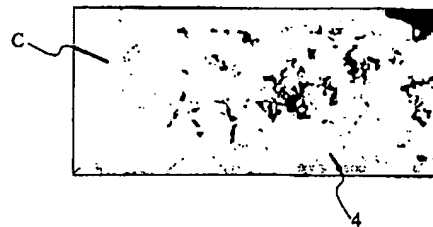


FIG. 4B



FIG. 5B



***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamagawa et al. (US 5,777,838) in view of Fujii (JP 2000-344584), Shinkai et al. (JP 2001-122673) and Hiramatsu et al. (WO01/63972).

4. With regard to Claim 1, Tamagawa et al. teaches a bonding member, comprising: a ceramics member (12) having a female portion (20); a metal member (22) which has a male portion fitted to the concave portion; a first bonding material (32) which joins a bottom portion of the female portion of the ceramics member (12) and a tip portion of the male portion of the metal member and has brazing filler metal that covers a corner between tip and side portions of the metal member; and a second bonding material (34) that joins a side portion of the female portion of the ceramics member and a side portion of the convex portion of the metal member (column 9 lines 24-38).

Tamagawa et al. does not teach that the female portion of the ceramics member is concaved, or that the male portion of the metal member is convex. Tamagawa et al., further does not teach that the first bonding material has a porous structure including particles and brazing filler metal or that the seconds bonding material includes brazing filler metal.

Fujii, in Figure 1, teaches an electrostatic chuck, wherein a ceramic member has a concave portion and a terminal member has a convex portion wherein a brazing material is used to bond the two members together.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tamagawa et al. with Fujii, by shaping the hole (20) of Tamagawa et al. with a concave shape and forming the metal terminal (22) of Tamagawa et al. in a convex shape, for the purpose of reducing terminal edge

stress which can apply pressure to the bonding material thereby improving quality and performance.

As applicant admits in on page 2 lines 19-23 of the specification, Shinkai et al., teaches an adhesive for joining different members wherein a bonding adhesive composition includes a porous structure containing particles and brazing filler metals.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tamagawa et al. with Shinkai et al., by Replacing the bonding material (32) of Tamagawa et al. with the bonding material of Shinkai et al., for the purpose of providing a stronger bond between the tip of the metal member and the bottom of the concave portion of the ceramic member.

Hiramatsu et al., teaches a ceramic substrate wherein solder and brazing filler metal can be used interchangeably.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tamagawa et al. with Hiramatsu et al. replacing the solder (34) taught by Tamagawa et al. with the brazing filler metal as taught by Hiramatsu, for the purpose of providing a better bond between the two dissimilar materials thereby reducing component failure.

Further, Tamagawa et al. in view of Fujii and Shinkai et al. discloses the bonding member of Claim 1, except that the second bonding material is solder instead of filler metal. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use filler metal as the second bonding member instead of solder, since it has been held to be within the general skill of a worker in the art to select

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a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

5. With regard to Claim 2, Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. discloses the bonding member of Claim 1. Fujii further discloses that when the corner radius between tip and side portions of the convex portion is R1 (8d) and a corner radius between bottom and side portions of the concave portion is R2 (9C), a condition of  $R1 (8d) \geq R2 (9c) \times 0.6$  is satisfied.

Fujii teaches that the outer radius (9c) is 1-2 times larger than the inner radius (8d). If the corner radii are equal to each other, then the above condition is satisfied. Support can be found in column 5, lines 20-35 in the English language equivalent, US 6,590,760.

Further, even if Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. did not disclose the condition found above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the radii of the corners of the concave and convex members to an optimal value, since it has been held that discovering an optimal value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

6. With regard to Claim 3, Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. discloses the bonding member of Claim 1. Fujii further discloses that

the corner radius between tip and side portions of the convex portion is not less than 0.3 mm (column 5 lines 33-35 English language equivalent).

7. With regard to Claim 4, Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. discloses the bonding member of Claim 1. Tamagawa further discloses a vent hole (36), which penetrates in a vertical direction inside the male portion from a bottom portion of the male portion.

8. With regard to Claim 5, Tamagawa et al. teaches an electrostatic chuck for absorbing an object to be processed, the electrostatic chuck, comprising: a substrate (12) which includes an electrode (14) therein and has a terminal bonding hole (20); a terminal (22) which is a member made of a different material from that of the substrate and supplies power to the electrode; a bottom portion bonding material (32) which joins a bottom portion of the terminal bonding hole (20) and a tip portion of the terminal (22) and has a brazing filler metal that covers a corner between tip and side portions of the terminal; and a side portion bonding material (34) that joins a side portion of the terminal bonding hole and the side portion of the terminal.

Tamagawa et al. does not teach that the terminal bonding hole of the ceramics member is concaved, or that the terminal of the metal member is convex. Tamagawa et al., further does not teach that the first bonding material has a porous structure including particles and brazing filler metal or that the seconds bonding material includes brazing filler metal.



Fujii, in Figure 1, teaches an electrostatic chuck, wherein a ceramic member has a concave portion and a terminal member has a convex portion wherein a brazing material is used to bond the two members together.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tamagawa et al. with Fujii, by shaping the hole (20) of Tamagawa et al. with a concave shape and forming the metal terminal (22) of Tamagawa et al. in a convex shape, for the purpose of reducing terminal edge stress which can apply pressure to the bonding material thereby improving quality and performance.

As applicant admits in on page 2 lines 19-23 of the specification, Shinkai et al., teaches an adhesive for joining different members wherein a bonding adhesive composition includes a porous structure containing particles and brazing filler metals.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tamagawa et al. with Shinkai et al., by Replacing the bonding material (32) of Tamagawa et al. with the bonding material of Shinkai et al., for the purpose of providing a stronger bond between the tip of the metal member and the bottom of the concave portion of the ceramic member.

Hiramatsu et al., teaches a ceramic substrate wherein solder and brazing filler metal can be used interchangeably.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tamagawa et al. with Hiramatsu et al. replacing the solder (34) taught by Tamagawa et al. with the brazing filler metal as

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taught by Hiramatsu, for the purpose of providing a better bond between the two dissimilar materials thereby reducing component failure.

Further, Tamagawa et al. in view of Fujii and Shinkai et al. discloses the bonding member of Claim 1, except that the second bonding material is solder instead of filler metal. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use filler metal as the second bonding member instead of solder, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

9. With regard to Claim 6, Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. discloses the bonding member of Claim 5. Fujii further discloses that when the corner radius between tip and side portions of the convex portion is R1 (8d) and a corner radius between bottom and side portions of the concave portion is R2 (9C), a condition of  $R1 (8d) \geq R2 (9c) \times 0.6$  is satisfied.

Fujii teaches that the outer radius (9c) is 1-2 times larger than the inner radius (8d). If the corner radii are equal to each other, then the above condition is satisfied. Support can be found in column 5, lines 20-35 in the English language equivalent, US 6,590,760.

Further, even if Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. did not disclose the condition found above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the radii of the corners

of the concave and convex members to an optimal value, since it has been held that discovering an optimal value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

10. With regard to Claim 7, Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. discloses the bonding member of Claim 5. Fujii further discloses that the corner radius between tip and side portions of the convex portion is not less than 0.3 mm (column 5 lines 33-35 English language equivalent).

11. With regard to Claim 8, Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. discloses the electrostatic chuck of Claim 5 except that a thickness of the side portion bonding material is 0.008 to 0.012 times a diameter of the terminal. It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose an optimal value of bonding material thickness, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

12. With regard to Claim 9, Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. discloses the electrostatic chuck of Claim 5. Tamagawa et al. further discloses a bonding material housing hole which houses brazing filler metal before bonding inside a convex tip of the terminal.

The hole of Tamagawa et al. can be used to house the bonding material until the terminal (22) is placed in the hole and into the bonding material.

13. With regard to Claim 10, Tamagawa et al. in view of Fujii, Shinkai et al. and Hiramatsu et al. discloses the bonding member of Claim 5. Tamagawa further discloses a vent hole (36), which penetrates in a vertical direction inside the male portion from a bottom portion of the male portion.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ushikoshi et al. (5,995,357) discloses a ceramic member-electric power supply connector coupling structure wherein a terminal is bonded to a ceramic structure.

Hegner et al. (US 5,670,063) discloses a method for making an interface connection through an insulating part wherein a filler metal (5) is used to bond a metal (4) to a ceramic (1) wherein the filler metal covers the corners of the metal terminal (4) and a second filler metal (5') bonds the sides of the terminal to the sides of the ceramic structure.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Bauer whose telephone number is 571-272-5986. The examiner can normally be reached on M-F 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SAB  
6 July 06



**CHAU N. NGUYEN**  
**PRIMARY EXAMINER**